

lateralis regione suprascapulari valde curvata, singulis squamis poro vel tubulo simplici notata; pinnis dorsali et anali basi alepidotis; dorsali spinis 2 anterioribus flexilibus ceteris multo longioribus; 1^a $\frac{3}{5}$ circiter in altitudine corporis, spinis ceteris gracillimis leviter pungentibus postrorsum longitudine accrescentibus posteriore ceteris longiore corpore plus duplo humiliore, dorsali radiosa spinis dorsalis posterioribus altiore postice angulata; pinnis pectoralibus acutis $5\frac{5}{8}$, ventralibus acutissimis $7\frac{3}{4}$ ad 8, caudali extensa margine posteriore medio convexa angulis radiis marginalibus parum productis acuta 8 ad $8\frac{1}{2}$ in longitudine corporis; anali dorsali radiosa vix humiliore postice angulata; colore corporis (in spirit. vin.) superne violascenti-roseo, inferne flavescenti-margaritaceo, dorso vittis transversis 16 ad 20 irregularibus plus minusve coalescentibus corpus semicingentibus fusciscenti-violaceis interstitiis latoribus; macula transversa oblonga margaritacea vel lutea, basin dorsalis radiosæ radium 4^m inter et 7^m intrante et pinnam analem non attingente; vitta impari mento-ventrali linea mediana cærulescente; pinnis dilute roseis vel flavescerent roseis, dorsali dimidio inferiore purpurea, dimidio superiore vittula intramarginali nigrescenti-purpurea, anali vitta basali et vitta mediana longitudinali flavis, margine inferiore violascente marginata. Longitudo speciminis unici (in Mus. Lugd. Bat.) 143 millim.

Hab. Ceram, in mari.

Leyden,
February 9, 1876.

XXI.—On the Budding of the *Cuninæ* in the Stomach of the *Geryonidæ*. By B. ULJANIN*.

DURING my sojourn in the winter of the present year at Villafranca and Naples, I had many opportunities of observing specimens of *Carmarina hastata*, Häck., which bore *Cunina*-buds in their stomachs. As the most detailed extant observations on these buds (those of Häckel in his 'Monographie der Rüsselquallen') are very incomplete, I bestowed particular attention upon this supposed *Geryonia*-brood, with the purpose of tracing their still entirely unknown development, and testing more accurately the hypothesis put forward by Häckel as to the genetic connexion of the *Geryonidæ* with the *Æginidæ*. My hopes, however, were only partially fulfilled. I certainly succeeded in observing a tolerably continuous series of the developmental stages of these *Cuninæ*, and in arriving at the

* Translated by W. S. Dallas, F.L.S., from the 'Archiv für Naturgeschichte,' 1875, pp. 333-337.

firm conviction that the *Cuninæ* which sprout in the stomach of the Geryonidæ are nothing but parasites of the *Carmarina*; but I could not manage to rear the young *Cuninæ* up to their full sexual maturity and to refer them to their parent form.

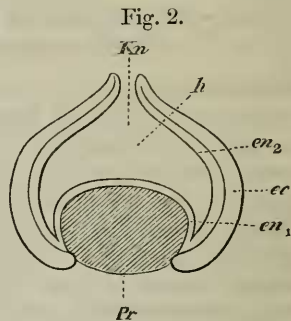
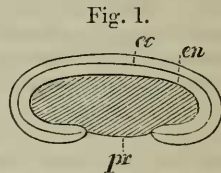
In what follows I briefly sum up the principal results of my investigations, and will hereafter publish a more detailed account of my observations elsewhere.

The youngest stage observed by me (fig. 1) is a larva measuring 0·17–0·25 millim., the body of which consists of a one-layered ectoderm and entoderm.

The two layers pass over into one another, and bound a cavity which opens outwards by an orifice and is almost entirely occupied by a finely granular mass (*pr*), which may sometimes be protruded a little from the orifice during the rather strong contractions of the larva. I have several times fished larvæ of the same structure with the muslin net from the sea at Villafranca, but have still more frequently met with them (sometimes in great abundance) in the stomach and radial canals of *Carmarina hastata*.

With the growth of the larva the cells, both of the ecto- and entoderm, are multiplied. In consequence of the much more rapid growth of the ectoderm, the entoderm splits into two layers, between which a cavity (the body-cavity of the polype) then becomes perceptible. The young animal, which still moves freely in the stomach and radial canals of the *Carmarina* by means of its ciliary coat (it is shown in longitudinal section in fig. 2), consists of the finely granular mass (*Pr*), which is surrounded by a series of cells (*en*₁), the lower layer of the split entoderm, and of the ectoderm (*ec*) with the upper layer of the split entoderm (*en*₂), by which the body-cavity (*h*) of the polype is bounded.

Soon after the cleavage of the entoderm of the larva and the formation of the cavity of the polype (*h*) between the two resulting entodermal layers, the short tentaculiform excrescences which serve to attach the young polype-stock to the *Carmarina* begin to sprout round the orifice of the mouth. Both body-layers of the polype take part in the formation of these



extraordinarily contractile tentacles, which are thickly furnished with numerous small, strongly refractive, round corpuscles (nettling capsules?). An animal in this state of development, such as I once met with at Naples floating with various other pelagic animals among the drift-materials of the surface, but more frequently found still adhering to the *Carmarina*, greatly resembles the peculiar medusoid creature from the bay of Nice described by Leuckart under the name of *Pyxidium truncatum*, especially as the latter, like the young *Cunina*-polypes observed by me, scarcely made any movement, and was only passively carried along.

As soon as the tentaculiform processes in the periphery of the buccal aperture are formed, the young animal attaches itself to some part of the body of the *Carmarina*. Most frequently this takes place on some part of the tongue of the Geryonid, or on the inner wall of the stomach. Sometimes also I found *Carmarinæ* more or less closely set with such young *Cunina*-polypes behind the velum, on the subumbrella. It is only very rarely, indeed almost exceptionally, that the *Carmarinæ* are burdened with a *Cunina*-polype; but then in general there are two at least, or even more, together. The animals adhere pretty firmly to the Geryonid; but when carefully detached they live for a long time, and even become still further developed in experimental glasses.

After the young *Cunina*-polypes have attached themselves to the Geryonid they are subject to no further important metamorphosis. The young polype grows rapidly, and at the same time changes its originally rather broad and depressed form for a more elongated one. The finely granular mass, which almost entirely occupied the body-cavity of the free-swimming larva and which is also long visible in the polype, constantly becomes smaller as the latter grows, and at last entirely disappears; it is evidently used up as nutriment by the growing polype. Such polypes (bud-cars, *Knospenähren* of Hæckel) as have the form of a much elongated, strongly contractile tube, and are already beset with a number of *Cunina*-buds, are tolerably correctly figured in the plate which accompanies Noschin's memoir ('Mélanges Biologiques,' tome v.).

I will not describe here the process of budding of the *Cuninæ* on the polype, as it has already been pretty completely and correctly observed by Noschin and Hæckel. I only remark that the rudiments of the first *Cuninæ* are to be observed even on the polypes which are not yet attached. (Such a rudiment is indicated at *kn* in fig. 2.) The important question, to which species the young *Cuninæ* belong, and whether they increase

sexually or asexually, could not, as already stated, be decided by me.

At first I thought I was justified in regarding the brood parasitic in the *Carmarina* as belonging to the *Cunina discoidalis*, Kef. & Ehl., which is pretty frequent at Villafranca and Naples; (and the resemblance of the *Cunina* sprouting in the stomach of *Carmarina* to *C. discoidalis* has already been noticed by Noschin;) but subsequently this supposition proved to be unfounded, as the young *Cunina* constricted off from the parasitic polypes became further developed in my aquaria, and then gradually lost their resemblance to *C. discoidalis*, two new marginal corpuscles, with the mantle-lobes belonging to them, being developed upon each segment.

Summing up the conditions here briefly described, it appears:—1, that the *Cunina*-brood which is developed in the stomach of *Carmarina hastata*, Hæck., stands in no genetic connexion with the *Geryonid*; and, 2, that the species of *Cunina*, the young of which is parasitic upon the *Geryonid*, is subject during its evolution to an alternation of generations. As is well known, a species of *Cunina* (*C. octonaria*) has already been observed by M'Crady, the brood of which is parasitic, as a proliferant polype, in an *Oceanid* (*Turritopsis nutricola*). As the *Cunina octonaria* of M'Crady certainly belongs to the same group (*Cunina* in Metznikow's sense) as that observed by me, and as this peculiar mode of development has hitherto been observed only in the species of this group, we may suppose that perhaps all the species of this group are subject to an alternation of generations, contrary to what takes place in the species of the group *Polyvenia*, Metzn., which are developed directly without alternate generations.

XXII.—*Descriptions of some new Species of Crustacea, chiefly from New Zealand.* By EDWARD J. MIERS, F.L.S., of the Zoological Department, British Museum.

HAVING been intrusted by Dr. Hector, F.R.S., with the compilation of a Catalogue of the species of Podophthalmatous and Edriophthalmatous Crustacea of New Zealand for the New-Zealand Government, I have thought it desirable to publish without delay descriptions of such species as do not appear to have been hitherto recorded: the type specimens of nearly all of these are in the collection of the British Museum, and they will be figured in the Catalogue. I have added descriptions of one or two allied new species from Australia and Tasmania in the collection.